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**Rocky Mountain  
Remediation Services, L.L.C.**  
... protecting the environment

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CORRES. CONTROL  
OUTGONG LTR NO.

DOE ORDER #

98 RF 02245

April 28, 1998

98-RF-02245

DIST.	LTR	ENC
Bengal, P.		
Benson, C. A.		
Burdellik, W.J.		
Crawford, A.C.		
Cypher, N.P.	X	X
Dunstan, L.A.		
Findley, M.		
Guinn, L.		
Hopkins, J. K.		
Huffman, F.M.	X	X
Hughes, F.P.		
Jenkins, K.		
Konwinski, G.		
Law, J. E.	X	X
Motyl, K. M.		
Primrose, A. L.	X	X
Rukavina, F.		
Steffen, D. E.		
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Norma I. Castañeda  
Environmental Compliance Division  
DOE/RFFO  
Building 460

TRANSMITTAL OF THE QUARTERLY STATUS REPORT FOR THE CONSOLIDATED WATER  
TREATMENT FACILITY - JEL-077-98

Rocky Mountain Remediation Services is pleased to deliver the attached copy of the Quarterly Status Report for Work Package B891 Groundwater Treatment Facility, 1 in fulfillment of the scheduled milestone due April 30, 1998. The task includes operations, maintenance and reporting activities for the Consolidated Water Treatment Plant and OU7 Passive Seep Interception and Treatment System.

If there is any additional information you would like to have incorporated into the existing format for next quarter's report or clarification of the current report, please do not hesitate to contact J. R. (Russ) Cirillo on extension 5876 or digital pager 212-6192.

John E. Law  
Director  
Environmental Restoration

JRC:slm

Orig. and 1 cc - N. I. Castañeda

Attachment:  
As Stated

cc:  
S. J. Hahn - Kaiser-Hill - Bldg. T130C  
A. Rodgers - Kaiser-Hill - Bldg. T130C  
J. Uhland - Kaiser-Hill - Bldg. T130C

PATS (T130G)  
RMRS CC (116) X  
CORRES. CONTROL X  
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UCN  
UNCLASSIFIED X  
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REVIEW WAIVER PER

Exemption # CEX-010-98

DATE

IN REPLY TO RFP CC NO:

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☐ PARTIAL

LTR APPROVALS:

ORIG &amp; TYPIST INITIALS:

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ADMIN RECCRD

OU07-A-000510



**QUARTERLY REPORT**  
**CONSOLIDATED WATER TREATMENT FACILITY**  
**AND**  
**OU7 PASSIVE SEEP INTERCEPTION AND**  
**TREATMENT SYSTEM**

**FOR JANUARY THROUGH MARCH 1998**  
**INCLUDING DATA SUMMARY FOR**  
**OCTOBER THROUGH DECEMBER 1997**

**Rocky Mountain Remediation Services, L.L.C.**

**APRIL 1998**

## TABLE OF CONTENTS

### SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

1.0 INTRODUCTION .....	1
2.0 CWTF OPERATIONS .....	2
2.1 QUANTITIES OF WATER COLLECTED AND TREATED.....	2
2.2 CHEMICAL USAGE .....	4
2.3 WASTE GENERATION .....	4
3.0 INFLUENT AND EFFLUENT SAMPLING .....	7
3.1 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND BUILDING 881 FOOTING DRAIN CHARACTERISTICS .....	7
3.2 OU2 SURFACE WATER CHARACTERISTICS .....	8
3.3 TREATED EFFLUENT CHARACTERISTICS .....	9
4.0 ENVIRONMENTAL COMPLIANCE .....	10
4.1 PERIODS OF NON-COLLECTION .....	10
4.2 AIR MONITORING .....	10
5.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER .....	11

### SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

6.0 INTRODUCTION, OPERATIONS, AND SAMPLING .....	12
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## TABLES

2-1	Approximate Quantities of Water Collected and Processed	3
2-2	Chemical Usage	5
2-3	Waste Generation	6

## **SECTION A - CONSOLIDATED WATER TREATMENT FACILITY (CWTF)**

### **1.0 INTRODUCTION**

The CWTF went on-line February 29, 1996. The CWTF is designed as a comprehensive facility combining individual IM/IRA treatment activities in order to reduce cost, increase efficiency, and offer treatment options to the Rocky Flats Environmental Technology Site (RFETS) in support of on-going Environmental Restoration (ER) activities and remediation.

The Consolidated Water Treatment Facility (CWTF) consists of the following specific unit operations:

- Chemical precipitation (T-900A/T-900B);
- Cross-flow membrane microfiltration (T-900A/T-900B);
- Ultraviolet Light/Hydrogen Peroxide Oxidation (Building 891);
- Granular Activated Carbon (Building 891); and
- Ion Exchange (Building 891).

A portable clay absorbent media drum is also available for use at the CWTF during water transfers from tanker trucks to CWTF influent storage tanks as a pretreatment of oily wastewaters. Waters are processed through the various CWTF unit treatment operations based on knowledge of the influent water characteristics in order to maximize treatment and reduce handling costs and waste generation.

The CWTF currently treats contaminated water from the following sources:

- Operable Unit (OU)1 groundwater and OU2 surface water
- Decontamination water from the Main Decontamination Facility (MDF) and Protected Area Decontamination Facility (PADF)
- Other ER waters (e.g., purge water, water pumped from containments, etc.)

The CWTF flowpath is flexible enough to allow waters to be treated through particular unit processes as necessary, and to allow for re-treatment if necessary.

## **2.0 CWTF OPERATIONS (January, February, March 1998)**

### **2.1 QUANTITIES OF WATER COLLECTED AND TREATED**

Table 2-1 summarizes the quantities of water treated at the CWTF for the period January through March 1998. During this period the CWTF accepted water from the following sources:

- OU1 French Drain Sump
- OU1 Collection Well
- OU2 Surface Water Station SW-59
- Snow melt/rain water pumped from CWTF containments
- MDF and PADF Water

As can be seen from Table 2-1, a total of approximately 95,170 gallons of water were treated through the Building 891 Ion Exchange Columns from January 1, 1998 through March 31, 1998. Approximately 94,208 gallons of the total water volume were treated through the chemical precipitation/microfiltration trailers.

Please note that because the CWTF is equipped with three Influent Tanks, the amount of water treated may be less than or greater than the amount of water collected for any given period.

During the period from January through March 1998, treated water was not released to the South Interceptor Ditch (SID).

As of March 31, 1998, approximately 4,105,541 gallons of water has been processed through the Building 891 Ion Exchange Columns.

**TABLE 2-1**  
**CONSOLIDATED WATER TREATMENT FACILITY**  
**APPROXIMATE QUANTITIES OF WATER COLLECTED AND PROCESSED a/**

Month/Year	Gallons Collected from the OU1 French Drain Sump b/	Gallons Collected from the OU1 Collection Well b/	Gallons Accepted at Bldg 891 from the MDF and Other Sources c/	Gallons Pumped from Bldg. 891 Containments	Gallons Collected from the OU2 SW-59	Gallons Processed through T900A/T900B	Gallons Processed through GAC at Bldg 891	Gallons Processed through IX at Bldg 891
Jan-98	21,105	1,860	3,754	1,446	2,367	24,531	0	20,780
Feb-98	20,475	1,270	0	511	0	23,720	12,200	31,766
Mar-98	31,913	1,530	0	10,811	2,380	45,957	44,636	42,624
1st Quarter Totals	73,493	4,660	3,754	12,768	4,747	94,208	56,836	95,170
Apr-98								
May-98								
Jun-98								
2nd Quarter Totals	0	0	0	0	0	0	0	0
Jul-98								
Aug-98								
Sep-98								
3rd Quarter Totals	0	0	0	0	0	0	0	0
Oct-98								
Nov-98								
Dec-98								
4th Quarter Totals	0	0	0	0	0	0	0	0
Year-to-Date Totals	73,493	4,660	3,754	12,768	4,747	94,208	56,836	95,170

a/ Please note that because the CWTF is equipped with Influent Tanks, the quantity of water collected will not necessarily equate to the quantity of water processed.

Also note that a 15,000 gallon surge tank (T-203) is in-line between the UV/GAC unit processes and IX #1, and therefore the quantity of water processed through UV/GAC will not equate to the quantity of water processed through IX.

b/ This ground water is collected each operating day (i.e., 5 days per week).

c/ Other sources may include purge water, ER Accelerated Action Project water, etc., such as the Mound Excavation, Mod Lab, or water collected in the B-750 Steam Pit.

d/ No UV/H<sub>2</sub>O<sub>2</sub> effluent was treated through the GAC.

## 2.2 CHEMICAL USAGE

The following chemicals are utilized during wastewater treatment operations at the CWTF:

- Building 891
  - Hydrogen peroxide (UV oxidation)
  - Hydrochloric acid (ion exchange regeneration and pH adjustment)
  - Sodium hydroxide (ion exchange regeneration)
- T-900A/T-900B trailers
  - Sulfuric acid (pH adjustment: TK-1 and effluent)
  - Calcium hydroxide (precipitation)
  - Ferric sulfate (precipitation)
  - Hydrogen peroxide (chemical cleaning of filter modules)
  - Sodium hydroxide (pH adjustment: TK-2)

Table 2-2 summarizes the quantities of chemicals utilized during the period of January through March 1998.

## 2.3 WASTE GENERATION

The following types of waste are generated during normal wastewater treatment operations at Building 891 and the T-900A/T-900B trailers:

- Building 891
  - used filter socks
  - neutralized ion exchange regenerant
  - personnel protective equipment
  - clay filter media
- T-900A/T-900B trailers
  - filter press sludge cake
  - personnel protective equipment
  - used filter membranes

Table 2-3 summarizes the types and quantities of the waste generated during wastewater treatment operations at the CWTF for the first quarter of 1998. From January 1, 1998 through March 31, 1998, 4,565 gallons of neutralized regenerant water from Tank 210 were sent to the Building 374 evaporator for processing.

**TABLE 2-2**  
**CONSOLIDATED WATER TREATMENT FACILITY**  
**CHEMICAL USAGE**

Month/Year	Building 891				T-900A/T-900B					
	Hydrochloric Acid 36% (gallons)	Sodium Hydroxide 50% (gallons)	Hydrogen Peroxide 50% (gallons)	Sulfuric Acid a/ 98% (gallons)	Calcium Hydroxide (pounds)	Ferric Sulfate (pounds)	Hydrogen Peroxide 35% (gallons)	Sodium Hydroxide 50% (gallons)	Sodium Hypochlorite (gallons)	
Jan-98	74.8	74.8	0.4	3.9	78.0	15.9	8.6	4.1	0.0	
Feb-98	199.0	102.0	1.4	3.8	90.0	11.5	7.9	4.6	0.0	
Mar-98	0.0	0.0	0.0	8.5	161.0	21.0	15.6	8.8	0.0	
1st Quarter Totals	273.8	176.8	1.8	16.1	329.0	48.4	32.1	17.5	0.0	
Apr-98										
May-98										
Jun-98										
2nd Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Jul-98										
Aug-98										
Sep-98										
3rd Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Oct-98										
Nov-98										
Dec-98										
4th Quarter Totals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Year-to-Date Totals	273.8	176.8	1.8	16.1	329.0	48.4	32.1	17.5	0.0	

a/ In addition to the sulfuric acid quantity listed in this column, occasionally a small amount (approximately 1 gallon per effluent tank) of sulfuric acid is used in Building 891 for effluent pH adjustment.



**TABLE 2-3**  
**CONSOLIDATED WATER TREATMENT FACILITY**  
**WASTE GENERATION**

Month/Year	Building 891			T-900A/T-900B			Bldg 891/T-900A/T-900B	
	Filter Socks (55-gal drum)	Neutralized Regenerant to 374 (gallons)	Spent Media (drums)	Sludge Production (55-gal drum)	Spent GAC (pounds)	Used Filter Membranes (55-gal drum)	Personal Protective Equip. (55-gal drum) a/	
Jan-98	--	4,565	0	2	0	0	--	
Feb-98	--	0	0	0	0	0	--	
Mar-98	--	0	1	2	0	0	--	
1st Quarter Totals	0 d/	4,565	1	4	0	0	b/,c/	
Apr-98		0	0	0	0	0	--	
May-98		0	0	0	0	0	--	
Jun-98		0	0	0	0	0	--	
2nd Quarter Totals	d/	0	0	0	0	0	--	
Jul-98	--	0	0	0	0	0	--	
Aug-98	--	0	0	0	0	0	--	
Sep-98	--	0	0	0	0	0	--	
3rd Quarter Totals	0 d/	0	0	0	0	0	--	
Oct-98	--	0	0	0	0	0	--	
Nov-98	--	0	0	0	0	0	--	
Dec-98	--	0	0	0	0	0	--	
4th Quarter Totals	0 d/	0	0	0	0	0	--	
Year-to-Date Totals	0	4,565	1	4	0	0	0	

0	4,565	1	4	0	0	0	0
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a/ PPE is monitored for radiological contaminants, and if determined to be acceptable for unrestricted release, is sent to the Rocky Flats landfill for disposal. Until the acceptance of water from an ER Accelerated Action Project in February 1996, no PPE from Building 891 or the T-900A/T-900B trailers had been found to be radiologically contaminated.

b/ PPE is collected from water treatment operations, MDF decontamination operations, etc. and is drummed collectively.

c/ These drums are filled gradually, and therefore only quarterly totals are reported.

d/ Used filter socks are drummed with other compatible wastes generated onsite, therefore the drums generated cannot be tracked.

## SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

### 3.0 INFLUENT AND EFFLUENT SAMPLING (October through December 1997)

#### 3.1 OU1 FRENCH DRAIN SUMP, COLLECTION WELL, AND BUILDING 881 FOOTING DRAIN CHARACTERISTICS

Collection Well water is now collected separately from the French Drain Sump water, and collection and treatment of water from the Building 881 Footing Drain was discontinued in December 1994. Therefore the current French Drain Sump data is representative of only those waters that seep from the groundwater table into the French Drain. For the October, November and December 1997 period, quarterly sampling was performed at the French Drain Sump, the Collection Well, and the Building 881 Footing Drain.

VOCs, Radionuclides, Metals, and Water Quality for the French Drain Sump, the Collection Well, and the Building 881 Footing Drain have been reviewed and compared to the OU1 ARARs. Note that it has historically been assumed that the OU1 ARARs for radionuclides and metals are dissolved values. Those constituents which did exceed OU1 ARARs include the following:

FRENCH DRAIN SUMP (891COLGAL)			
Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
Selenium (Total)	20.4	ug/L	5

COLLECTION WELL (891COLWEL)			
Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
1,1-Dichloroethene	27	ug/L	7
Methylene chloride	68	ug/L	5
Tetrachloroethene	67	ug/L	5
Trichloroethene	510	ug/L	5
Selenium (Total)	550	ug/L	5
Gross Alpha	13.1 +/- 8.1	pCi/L	7
Gross Beta	10.1 +/- 6.4	pCi/L	8
Uranium (Total)	18.2 +/- 0.8	pCi/L	11

BUILDING 881 FOOTING DRAIN (SW13494)			
Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
Tetrachloroethene	43	ug/L	5
Gross Alpha	9.5 +/- 5.5	pCi/L	7

\*CWTF ARAR is from the CWTF Sampling and Analysis Plan, Appendix A.

The Building 881 Footing Drain is currently being sampled for total radionuclides and total metals (refer to DOE letter ER:SRG:10199, dated December 29, 1994).

## SECTION A - CONSOLIDATED WATER TREATMENT FACILITY

### 3.2 OU2 SURFACE WATER CHARACTERISTICS

Presently only SW-59 water is collected and treated. Effective May 6, 1994, the collection and treatment of SW-61 and SW-132 was discontinued as per the authorization obtained on April 24, 1994 from the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and the Environment (CDPHE). Surface water is sampled on a quarterly basis from SW-59, SW-61, and SW-132.

The data for OU2 surface water has been reviewed and compared to the relevant ARARs; it has historically been assumed that the OU2 ARARs for radionuclides and metals are total values. Those constituents which did exceed OU2 ARARs include the following:

#### SURFACE WATER STATION: SW-59

Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
Carbon Tetrachloride	100	ug/L	5
Tetrachloroethene	22	ug/L	5
Trichloroethene	30	ug/L	5
Aluminum	16500	ug/L	200
Copper	45	ug/L	25
Iron	18300	ug/L	1000
Lead	39.8	ug/L	6.5
Manganese	19800	ug/L	1000
Selenium	6.5	ug/L	5
Zinc	3130	ug/L	141
Gross Alpha	31 +/- 10	pCi/L	7
Gross Beta	30.8 +/- 6.6	pCi/L	8
Americium 241	0.379 +/- 0.0979	pCi/L	0.15

#### SURFACE WATER STATION: SW-61

Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
Carbon tetrachloride	5.6	ug/L	5
Vinyl Chloride	10	ug/L	2
Aluminum	438	ug/L	200
Americium 241	0.920 +/- 0.510	pCi/L	0.15
Plutonium 239/240	0.161 +/- 0.153	pCi/L	0.15

#### SURFACE WATER STATION: SW-132

Compound	Exceedance Value	Units	CWTF ARAR* (Chemical Specific)
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No Exceedances Detected

\*CWTF ARAR is from the CWTF Sampling and Analysis Plan, Appendix A.

### **3.3 TREATED EFFLUENT CHARACTERISTICS**

Treated effluent from the CWTF is stored in one of three Effluent Storage Tanks prior to discharge. An Effluent Storage Tank is sampled once it is full, and the tank is discharged if the data show that ARARs have not been exceeded. No water was discharged during the first quarter of 1998.

## **4.0 ENVIRONMENTAL COMPLIANCE**

### **4.1 PERIODS OF NON-COLLECTION**

All collections were performed for the first quarter. It should be noted that the production of water at the SW-59 site was very low over the course of the quarter. The reduction was most likely caused by seasonal variation in the quantity of water seeping from the hillside, and was not due to any periods of non-collection.

### **4.2 AIR MONITORING**

In October 1997, a sulfide odor was detected in Building 891. The GAC vessel was determined to be the source of the odor, which was most-likely caused by a sulfate reducing bacteria. Air monitoring was performed and a recommendation was made to run the exhaust system during processing to eliminate any health risk to workers inside the building. Additional monitoring was performed downwind of the CWTF to ensure the absence of health risks to other Contractor's Yard personnel. The GAC vessel was chemically cleaned twice in February. The GAC was returned to service in February with greatly improved reduction of unusual odors detected.

## **SECTION A - CONSOLIDATED WATER TREATMENT FACILITY**

### **5.0 ANTICIPATED OPERATIONS FOR NEXT QUARTER**

Collection and treatment of water from the French Drain Sump will continue as normal. Water from the Collection Well will continue to be collected using the portable trailer and transported to the CWTF for off-loading and treatment. Purge, incidental, and decontamination pad waters will continue to be accepted and treated.

Collection of SW-59 weir water into T-59 (the double-walled tank located just south of the SW-59 weir box) began on December 30, 1996. This collected water is now periodically transported to the CWTF via tanker truck.

The CWTF will continue to accept and treat waters from Environmental Restoration Projects. Projects being supported with water treatment activities include the Trench 1 remediation and 903 Pad Characterization.

Discussions were finalized regarding the sampling of OU-1 and OU-2 locations. Starting in the second quarter of 1998 the sampling will be conducted by the groundwater and surface water groups in order to incorporate these sites into the appropriate Integrated Monitoring Plan.

## SECTION B - OU7 PASSIVE SEEP INTERCEPTION AND TREATMENT SYSTEM

### 6.0 INTRODUCTION, OPERATIONS, AND SAMPLING

The OU7 Passive Seep Interception and Treatment System (PSITS) is designed to collect and treat OU7 seep water and thereby eliminate, to the extent practicable, the discharge of the FO39-listed waste contained in this seep water to the East Landfill Pond. The collection and treatment system is comprised of the following items:

- A seep interception system.
- A settling basin to remove total suspended solids.
- A bag filtration system consisting of two filters operated in parallel (currently 25 micron bags are in use in the system).
- Two 55 gallon drums of granular activated carbon (GAC) are operated in series to remove volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

During the first quarter of 1998, changeout of the bag filters was required on March 24.

There was one period of system bypass recorded beginning on March 22, and ending on March 24. Bag filters became clogged with sediment during high flow. The system was in bypass mode for approximately 44 hours. The EPA and CDPHE will be notified immediately in any instance where bypass continues longer than 72 hours. Periods of bypass less than 72 hours will be documented in this report.

During the first quarter of 1998, the treatment study data was evaluated to determine the effectiveness of the system. The treatment will continue with modifications to the current process to include monthly GAC changeouts and quarterly sampling. Further modifications may become necessary based on future evaluations of the system.

Constituents which exceeded the Treatment System Performance Objectives are listed below:

#### OU-7 PASSIVE SEEP INTERCEPTION TREATMENT SYSTEM OUTFALL (SW00196) October 8, 1997

Compound	Exceedance Value	Units	RFCA 1996 Action Level
Vinyl Chloride	2.40	ug/L	2

#### December 8, 1997

Compound	Exceedance Value	Units	RFCA 1996 Action Level
Vinyl Chloride	2.80	ug/L	2